
Introduction to the MITA Framework 2.0

Introduction

The Medicaid IT Architecture (MITA) Framework is a blueprint that States can use to examine their business priorities, plan future improvements, and acquire technical applications that meet both their needs and the objectives of the MITA initiative.

The MITA Framework describes a logical architecture for the Medicaid enterprise. It includes a Business Architecture (BA), Information Architecture (IA), and Technical Architecture (TA).

This introduction covers the following topics:

- What is the MITA Framework?
- What are the components of the MITA Framework?
- How do the components of the three architectures fit together?
- How should Framework 2.0 be read?

What Is the MITA Framework?

The MITA Framework is a consolidation of principles (e.g., interoperability, data sharing, and reusability), models (e.g., the MITA Maturity Model [MMM], Business Process Model [BPM], and various Technology Models), and national guidelines, such as those promoted by the Office of the National Coordinator for Health IT (ONC), the Federal Enterprise Architecture (FEA), and Federal Health Architecture (FHA). States can use the Framework to develop their own enterprise architectures.

The MITA Framework also draws from several industry-accepted models, including the Zachman Framework, the Federal Enterprise Architecture Framework (FEAF) Reference Models, the National Association of State Chief Information Officers (NASCIO) Architecture Handbook, and other contemporary methodologies. The MITA team adapted industry methodologies and models to meet the unique requirements of State Medicaid programs across the country. The result of this effort is a series of architectures, models, and supporting processes optimized for the multistate Medicaid community.

The MITA Framework is business-driven. Part I, Business Architecture, summarizes the vision and objectives expressed by many States, by the Centers for Medicare & Medicaid Services (CMS), and by other agencies. Part II, Information Architecture, describes the data and information needs that are aligned with the business requirements. (In some cases, information may actually be the driver of business improvements.) Part III, Technical Architecture, is a compendium of models and approaches designed to support the business and information needs. It is a MITA principle *not* to implement technology simply because it is available.

The MITA Framework development is shown in **Figure I-1**.

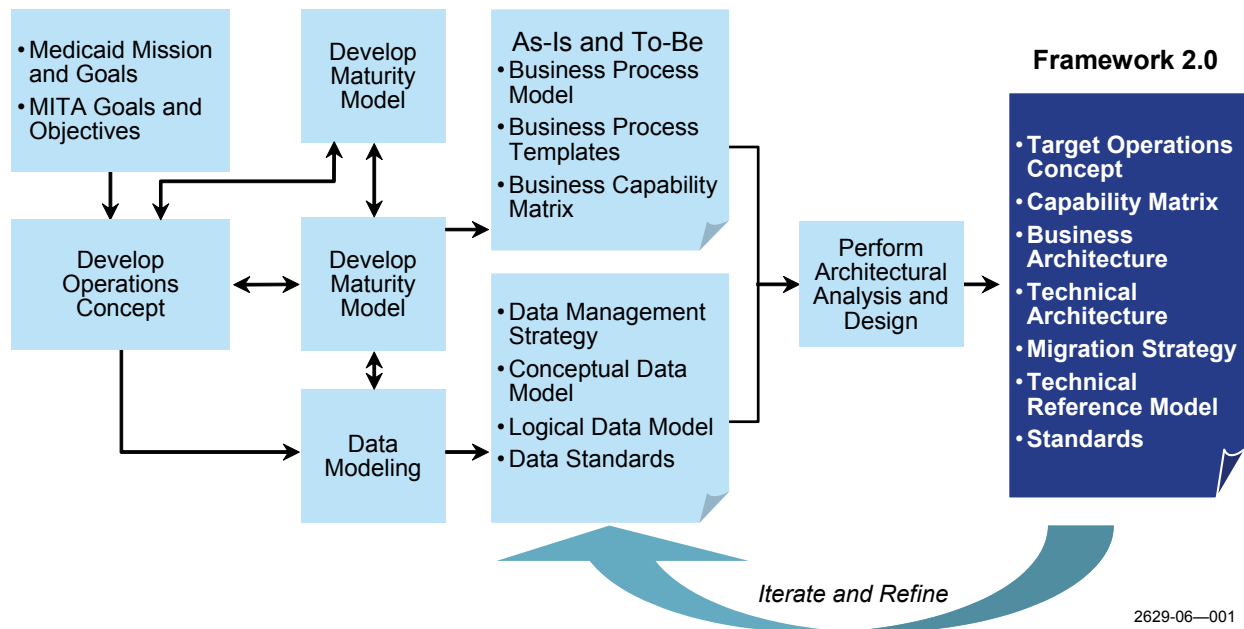


Figure I-1. MITA Framework Development Approach

What Are the Components of the MITA Framework?

The MITA Framework is organized as follows:

- Part I — Business Architecture
- Part II — Information Architecture
- Part III — Technical Architecture

These are living architectures that are evolving as the MITA initiative matures. The relationships among the architectural components are summarized in the section titled “How Do the Components of the Three Architectures Fit Together?”

The following is a brief overview of the MITA Framework.

Part I — Business Architecture

The MITA BA describes the current and future (i.e., near-term and long-term) common business operations of a State Medicaid enterprise. The MITA BA allows States to map their current operations and future improvements to models of a business vision, to business processes, and to business capabilities. States can use the business models in the BA to do the following:

- Drive the development of a target State Medicaid IT architecture
- Develop a plan to transition to higher levels of maturity, as defined in the MITA Framework

The MITA BA includes the following components, each represented by a chapter:

- Concept of Operations
- Maturity Model
- Business Process Model
- Business Capability Matrix
- State Self-Assessment

An overview of each of these follows.

Concept of Operations

The MITA Concept of Operations (COO) is an approach adopted from industry to describe the As-Is and To-Be representations of the enterprise in a way that provides a structure for defining a vision of the future and establishing common goals for improvement. The vision and goals for the Medicaid enterprise were derived from a series of visioning sessions at the Medicaid Management Information System (MMIS) conference in 2003 and interviews with individual States, the Center for Medicaid and State Operations (CMSO) Divisions, CMS Regional Offices, other Federal agencies, Federal initiatives (e.g., the National Health Information Infrastructure [NHII]), and industry experts.

The COO addresses the following:

- As-Is operations common to all State Medicaid programs
- To-Be operations envisioned as a long-term goal for all States
- The evolution of stakeholder roles from the As-Is to the To-Be
- The improvement of information over time
- Drivers and enablers that will facilitate the transformation
- The transformation pathway described in the MITA Framework

Figure I-2 shows an example of the To-Be state of operations the COO envisions. The To-Be represents a paradigm shift in the way States will conduct Medicaid business and the ways in which providers and beneficiaries will interact with the State agency. In this future time, clinical, administrative, and demographic information will be accessed easily and exchanged by beneficiaries, providers, and Medicaid administrators (with appropriate privacy and security safeguards) so that decision makers can make informed decisions quickly to realize the ultimate goals of improved health outcomes and affordable costs.

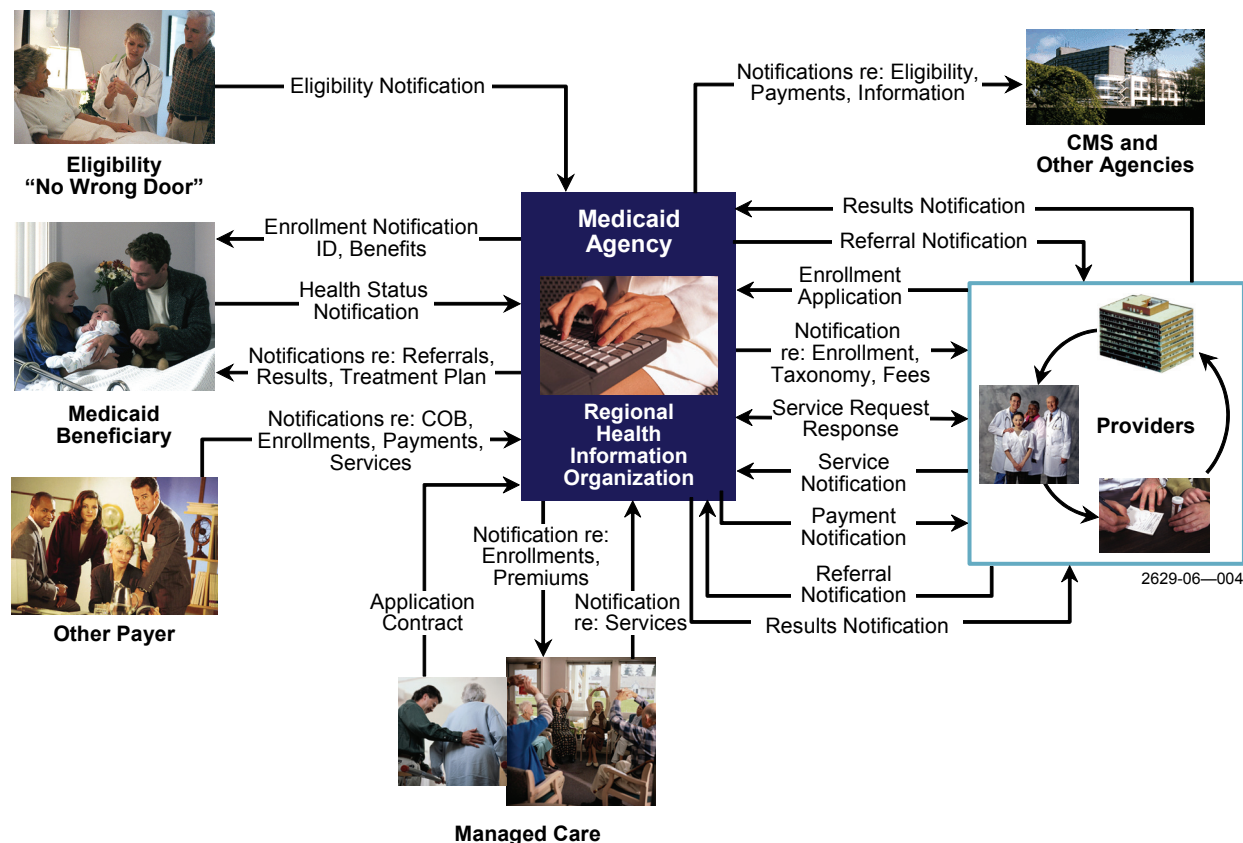


Figure I-2. To-Be Medicaid Operations — An Information-Exchange Focus

MITA Maturity Model

In general, a *maturity model* is a tool used by industry and government organizations to illustrate how a business can mature over time. Specifically, the MMM is an adaptation of industry maturity models to the multistate Medicaid environment. The MMM describes five levels of progressive improvements over a 10+ year timeline. The MMM provides generic descriptions of the five levels of maturity and distinguishes among them using a set of *qualities*. The MMM is a point of reference used to define business capabilities for Medicaid business processes (see Business Process Model and Business Capability Matrix below).

Figure I-3 illustrates the five MMM levels of maturity over a 10+ year timeline.

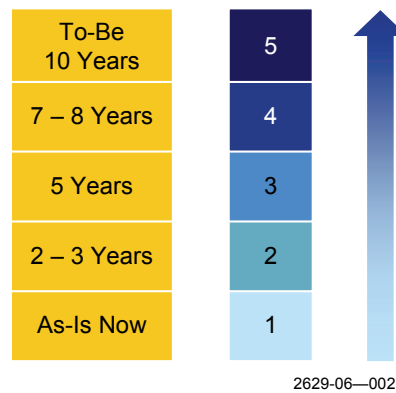


Figure I-3. The Five Maturity Levels in the MITA Maturity Model

Business Process Model

The MITA BPM presents a hierarchy of Medicaid business processes organized into categories (or *tiers*) of processes (see **Figure I-4**). Business process categories at the top tier are *business areas*. Lower-tier processes that represent clusters of business processes are Tier 2 through Tier *n* processes. The lowest level of the hierarchy is simply a *business process*. Each business process has a defined trigger and business outcome.

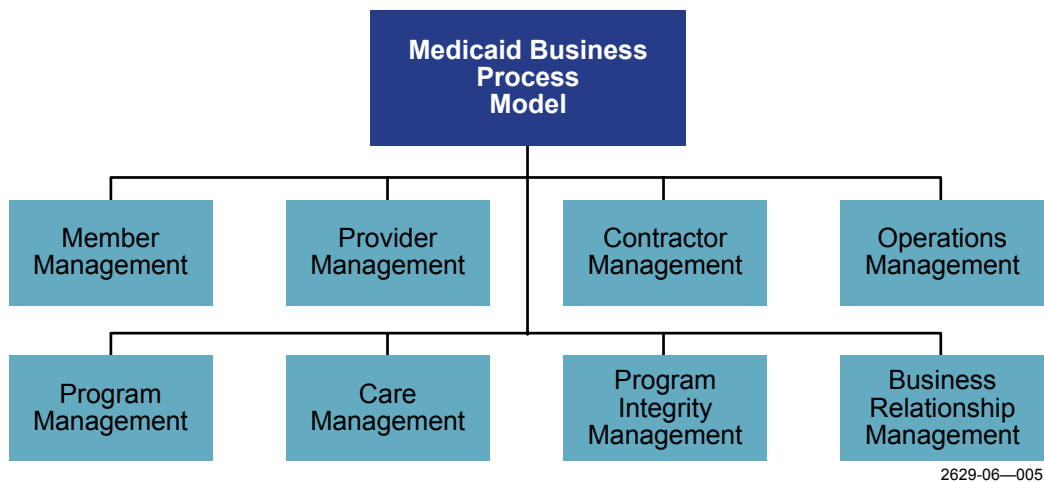


Figure I-4. The Eight Business Areas of the BPM

The BPM is derived from the Systems Technical Advisory Group (S-TAG) report on reengineering the MMIS, the CMS Medicaid Health Insurance Portability and Accountability Act of 1996 (HIPAA)-Compliant Concept Model (MHCCM), and many individual States' business process models. Given the availability of these models, the MITA Framework begins

with the BPM and business capabilities and links them to related data requirements. One can begin with data and information requirements and improvements and define associated business capabilities. The MITA initiative calls for the development of a common data model and standards.

Business Capability Matrix

An organization's *business capability* is its ability to execute a business process at a certain level of maturity as defined in the Business Capability Matrix (BCM). MITA derives business capabilities by applying the MMM to business processes as defined for the BPM. Each business process has as many as five levels of maturity.

The business capability also uses MMM qualities, which describe how effectively the process is being executed (e.g., ease of use, timeliness, and accuracy). In the future, the MITA initiative plans to add conformance criteria to each business capability. Conformance criteria are used to determine whether the business process has achieved a specific level of maturity.

Business capabilities illustrate how a business process can mature and improve over time. **Technical capabilities** are enablers that support the business process at specific levels of maturity or technologies that promote MITA goals and objectives (e.g., flexibility, adaptability, and interoperability).

State Self-Assessment

A State Self-Assessment is a State's review of its own strategic goals, objectives, and current business capabilities against the MITA BCM. After a self-assessment, the State can develop a list of target capabilities that allow it to meet its strategic goals and objectives. Target capabilities are those capabilities that the State plans to implement to transform its Medicaid enterprise in accordance with MITA principles. Higher maturity levels correspond to greater levels of operational effectiveness of the Medicaid program. (Capabilities for maturity Levels 4 and 5 have not yet been fully defined because they depend on healthcare developments in the 5 to 10+ year time frame, such as the NHIL.)

Part II — Information Architecture

The MITA IA is driven by the MITA BA. MITA identifies information needs for each business process and groups them as follows: subject areas → classes/objects/entities → attributes. The As-Is and To-Be conceptual models are constructed using the identified subject areas. Next, as the kinds of data needed by business processes are better defined, the MITA As-Is and To-Be conceptual models are detailed into Logical Data Models (LDMs) that divide and subdivide subject areas into classes and attributes, and relationships are modeled using class diagrams. The LDM development is an ongoing process — to be refined as business capabilities are refined.

Business Process Model Versus Data Model. The MITA Framework begins with the BPM and business capabilities and links them to a Conceptual Data Model (CDM) and an LDM. States could choose this approach or reverse the process for their transformation (i.e., first define the information requirements and then choose the business model that supports those requirements). The MITA Framework defines business processes first because data on relatively few State Medicaid business process models is available, as common data models and data standards are largely lacking.

The MITA IA describes the current and future (i.e., near-term and long-term) information and data needs of a State Medicaid enterprise. The IA uses a series of models to specify the key elements of information systems that Medicaid enterprises use to execute their business processes. These elements include the information itself, the applications that use the information to enable the business processes, and the combining of applications and information to support the enterprise's business functions. The BA and the IA together map enterprise data to business processes.

The MITA IA consists of the following components, each of which is represented by a chapter in Part II:

- Data Management Strategy
- Conceptual Data Model (CDM)
- Logical Data Model
- Data Standards

An overview of each of these components follows.

Data Management Strategy

The Data Management Strategy provides the approach to integrating and organizing data, through reference to data repositories and registries as well as links to metadata.

Conceptual Data Model

The CDM describes the principal entities and relationships the Medicaid enterprise requires, including MITA subject areas common to States and the relationships among those subject areas. The model is used primarily as a communication tool between the business user and the IT architect to obtain agreement on the scope of the data and relationships and facilitate the identification of subject areas. It represents the overall logical structure of the data independent of software or data storage structure, provides a formal representation of the data needed to run an enterprise or business activity, and might even include data objects not yet implemented (i.e., To-Be objects and relationships).

Logical Data Model

The LDM shows a data subject area divided into data classes, including the relationships among those classes, with attributes defined as needed for one drilled-down business process. The LDM

identifies all of the data elements in motion in the system or shared within the Medicaid enterprise. The MITA LDM does not include State-specific data objects and relationships.

Data Standards

Data Standards consist of a collection of standards applicable to the administration and operation of a Medicaid enterprise and identifies the applicable standard for each MITA data element. Each standard is defined by the following attributes:

- Title
- Category
- Objective
- Source (e.g., standards body)
- Type
- Versions and status
- Applicability
- References
- Relationships to other standards
- Key terms

The standards are identified in associated templates and relate to the key design aspects and concepts defined in the MITA Framework.

It is a MITA principle to use existing national/international standards if accepted by the Medicaid community. The MITA initiative can collaborate to create new, Medicaid-specific standards if standard-making organizations have not done so.

Part III — Technical Architecture

The MITA TA describes the current and future (i.e., near-term and long-term) set of business and technical services, their connectivity, and standards that a State can use to plan and specify new IT systems for a State Medicaid enterprise. The TA includes the following components:

- MITA technical principles, goals, and objectives
- Service-oriented architecture concept
- Business services
- Technical capability matrix
- Technical services
- Application architecture

- Technology standards
- Solution sets

Each component is represented by a chapter in MITA Framework 2.0. An overview follows.

MITA Principles, Goals, and Objectives

The MITA team defined technical principles, goals, and objectives for MITA, based on the Medicaid visions and objectives that States, CMS, and other agencies have contributed.

Service-Oriented Architecture

Service-oriented architecture (SOA) is a software design strategy that packages common functionality and capabilities (referred to as *services*) with standard, well-defined service interfaces to provide formally described functions that can be invoked using a published service contract. A service can be built using new applications, legacy applications, commercial off-the-shelf (COTS) software, or all three. SOA meets the MITA objectives of reusability and interoperability.

Over time, the SOA will tie together the key features of the MITA to achieve interoperability and data sharing across the Medicaid enterprise and ultimately among all States and data-sharing partners.

Figure I-5 presents the “big picture” view of interoperability within the Medicaid enterprise.

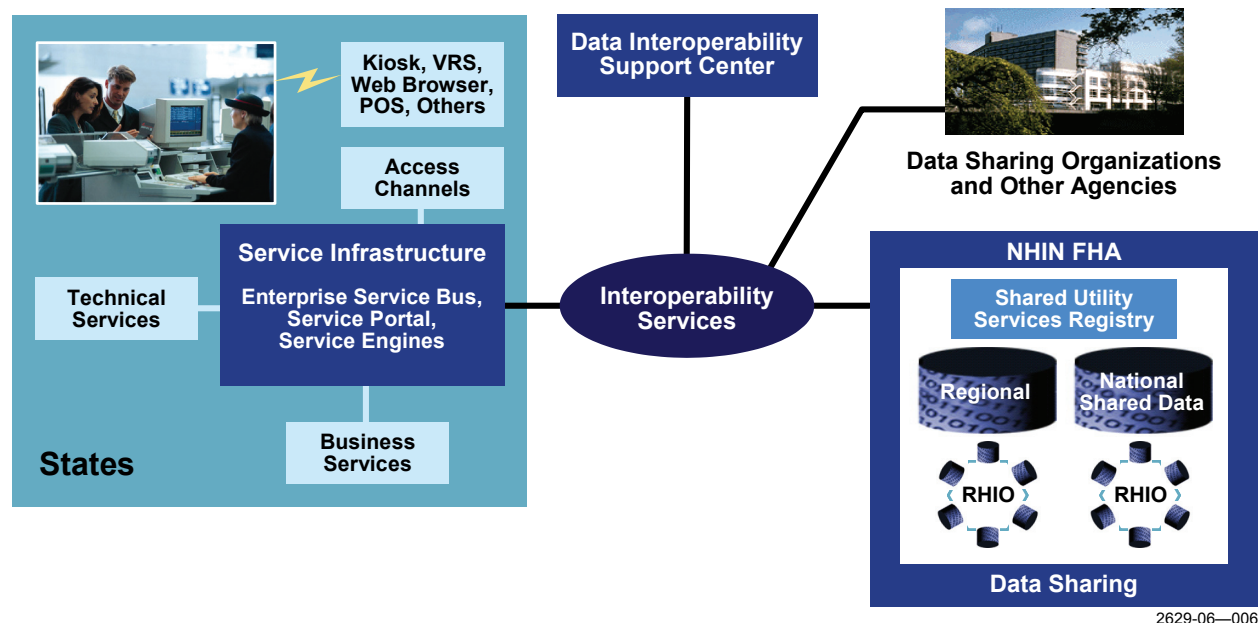


Figure I-5. Conceptual View of SOA in the Medicaid Enterprise

Business Services

A business service is software that implements a business capability (i.e., a specific maturity level) of a business process. It has a defined interface for its invocation, performs a defined function that corresponds to the capability, and returns defined results. MITA specifies a business service for each business capability.

Technical Capability Matrix

The MITA Technical Capability Matrix (TCM) defines a set of high-level (coarse-grained) technical components needed to do the following:

- Enable the MITA business capabilities at different levels of maturity
- Support the success of the Medicaid mission and goals
- Meet the MITA goals and objectives

The TCM provides a benchmark for States to follow in their alignment with MITA principles. The BCM and the TCM use the five levels of maturity described in the MMM. The TCM technical components associated with each level are intended as enablers of the corresponding business capability. Each technical capability consists of one or more technical services.

Technical Services

Technical services consist of a detailed set of technical functions that, collectively, define the MITA technology infrastructure. Each technical service, as with each business service, has a defined interface for its invocation, performs a defined function that corresponds to the capability, and returns defined results (e.g., authentication, data access, logging, presentation, and device-specific services).

Application Architecture

The MITA application architecture provides the information necessary to develop enterprise applications through the use of both business and technical services. An application, in the context of the TA, is a collection of software services that implement a business process at a specific level of maturity. The TA is essentially a set of diagrams that show how business and technical services are invoked and how they are coordinated to implement business processes (see **Figure I-6**).

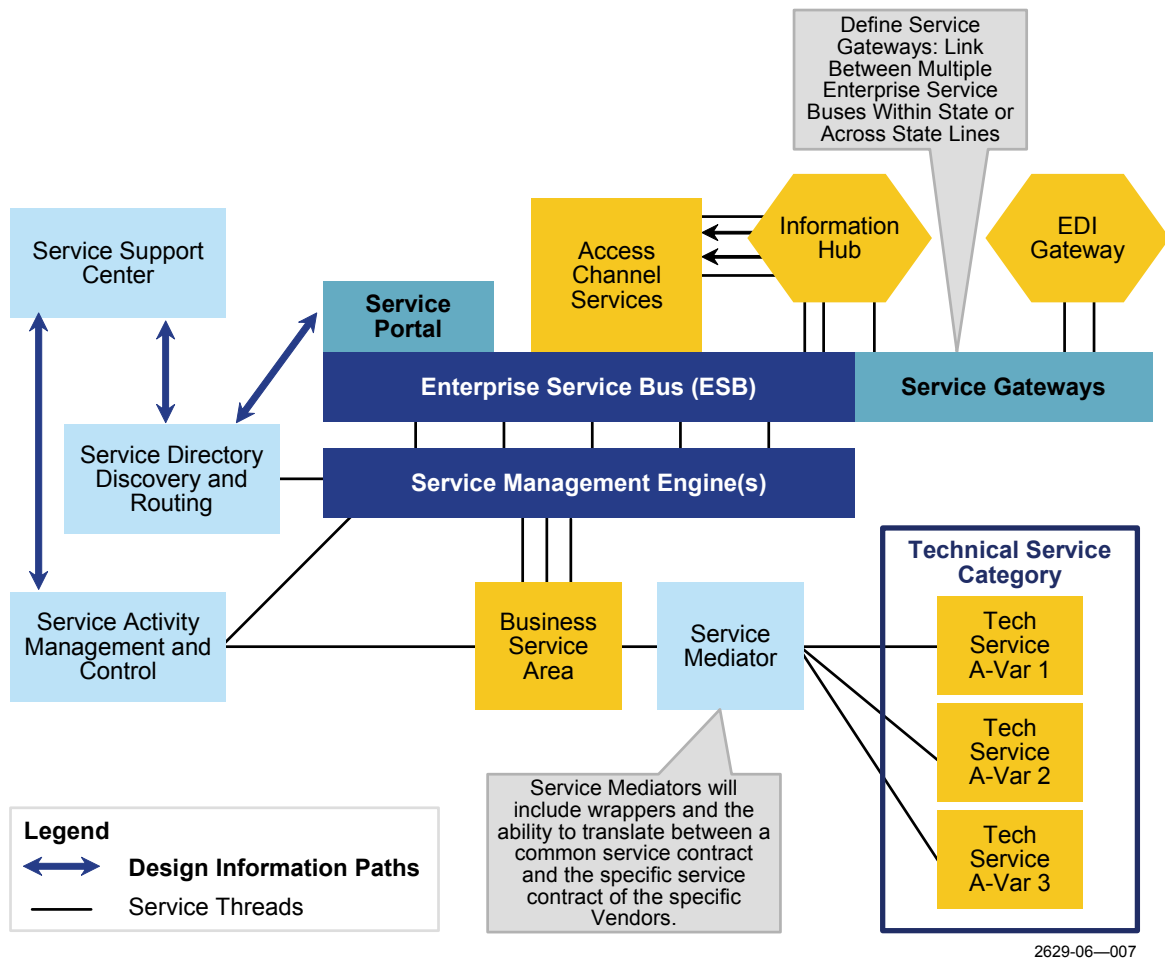


Figure I-6. An Application as a Collection of Software Services

Technology Standards

The TA contains a compilation of technology standards needed to support the overall MITA. They fall into two groups:

- Technical Reference Model
- Standards Profile

The Technical Reference Model consists of a list of technical services, either aggregated or divided into categories for which standards are specified.

The Standards Profile includes:

- Standard(s) currently in use
- Standards recommended for use in the future
- Emerging standards (long-term)

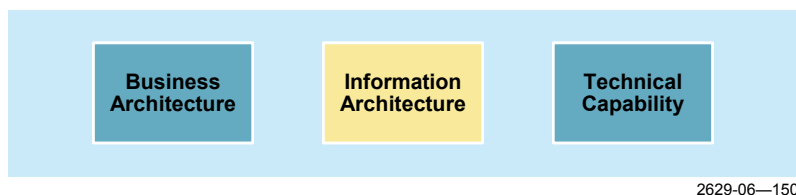
Solution Sets

Solution sets document a specific implementation pattern for a business process or business service. The MITA Framework provides a template for capturing metadata on the implementation approach. In the future, these templates can be stored in a repository that States can browse to identify services that others have implemented and technology options others have used in the implementation. States are responsible for entering data into the templates. MITA solution sets consist of resources such as requirements specifications, design approaches or patterns, design specifications, applicable standards, and test cases States can incorporate into RFPs. MITA solution sets will map to both business capabilities and technical capabilities to assist States with implementation planning.

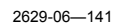
The MITA Framework helps ensure that a State's technology decisions align with Medicaid business needs and achieve business goals. As participation increases among States, the vendor community, and other stakeholders, the MITA Framework will be refined more specifically. State Medicaid enterprises will evolve to optimize adaptability, flexibility, interoperability, and data sharing. This evolution will enable major improvements in policy making, decision making, and day-to-day operations.

How Do the Components of the Three Architectures Fit Together?

Figure I-7 shows the interrelationships of the three architectures and their components. Color coding (or black and white shading) distinguishes the three architectures.



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Walkthrough of the BA, IA, and TA Components

The following text provides a narrative walkthrough of Figure I-7, Relationships among the components of the BA, IA, and TA. The Medicaid mission and goals and the MITA principles, goals, and objectives are shown as vision drivers at the top of the figure and influence all the architectural components below.

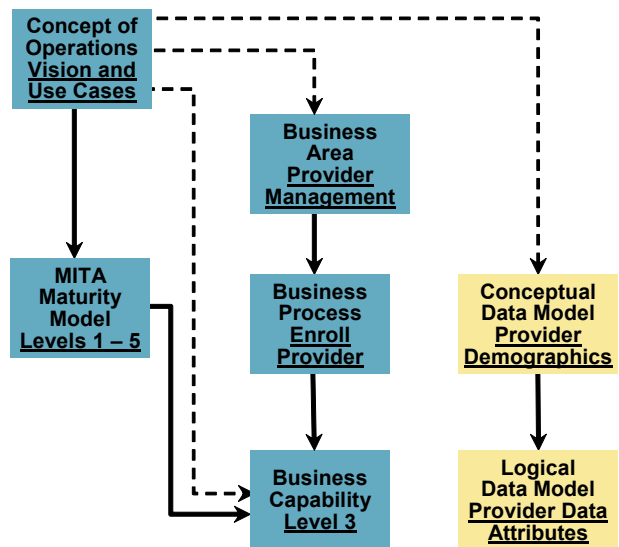
Medicaid Mission and Goals — MITA Principles, Goals, and Objectives

Business Architecture

The top left of Figure I-7 represents the BA. The COO is a structure used to capture the Medicaid vision. It includes storyboards and use cases to show a transformation of the Medicaid enterprise over time from the As-Is state to the To-Be state. It also influences the contents of the CDM.

The COO provides the base for the development of the BPM (which includes business areas and business process descriptions) and the BCM.

The COO is also the point of reference for the MMM. The MMM describes five levels of maturity to illustrate the migration from the As-Is state to the To-Be state.



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Applying the MMM to a business process produces up to five business capability statements tailored to the specific business process.

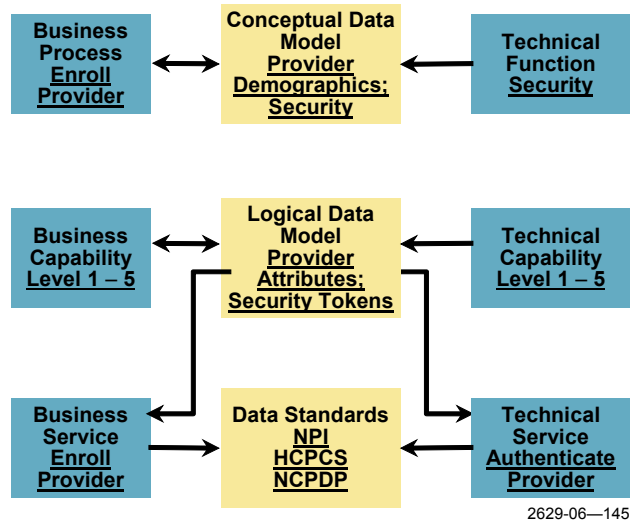
Each business process description names trigger and result data and may reference shared data that is mapped to the CDM. Business capability descriptions are mapped to the LDM.

It is also possible to start the journey by defining the CDM based on the Medicaid mission and goals. In this case, the CDM becomes the driver of the BPM.

Information Architecture

The center space of Figure I-7 contains three IA components: CDM, LDM, and Data Standards. The CDM identifies the core subject areas and groupings of data (or entities) important to the Medicaid enterprise. These are linked to the major business areas in the BA.

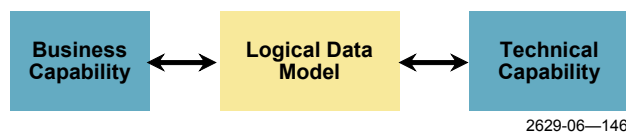
For example, the Provider Management business area requires entities (e.g., provider, group practice, location) and relationships (e.g., provider has an address). The CDM is not yet populated. Business process descriptions currently have “placeholders” for future CDM details (e.g., provider demographic data and licensing board data). The CDM also houses data groupings for use in technical areas and technical functions. For example, security/authentication requires security tokens found in the CDM.



The LDM adds detail to the CDM. Each entity is further defined in terms of attributes and related standards. The entity relationships are also expanded and refined. For example, *provider* is defined by National Provider Identifier (NPI), NPI taxonomy, name, and other attributes. The attributes are presented with more detail.

The LDM maps to specific business capabilities. For example, a beneficiary is able to inquire about his or her treatment history based on claims data at Level 3 and will be able to view personal clinical data at Level 4.

The LDM also maps to specific technical capabilities (e.g., a personal key identifier entity required to support the technical capability, “Authenticate Provider,” at Level 3). The LDM is not yet populated.



Each business service and technical service uses messages and interfaces contained in the LDM. The LDM references, where possible, existing, nationally recognized data standards. These are standards maintained by official standards development organizations (SDOs) such as X12N, HL7, and NCPDP.

Business and Technical Services use specific data standards. If no national standard exists for a Medicaid-specific data attribute, the MITA initiative calls for a process to develop the new standard.

The LDM stands at the point of intersection between the BA and the TA. For example, Enroll Provider at Level 3 Business Capability requires specific data entities and attributes as well as data objects such as Public Key Interface, a Level 3 Technical Capability for “Authenticate Provider”.

Technical Architecture

Moving to the right side and bottom of Figure I-7, the top three boxes of the Technical Architecture — Technical Area, Technical Function, and Technical Capability — parallel the Business Architecture.

As in the Business Architecture, the Technical Area is a grouping of Functions. Functions are assigned from one to five levels of Technical Capabilities. For example, Security is a Technical Area that contains an Authentication Function (among others).

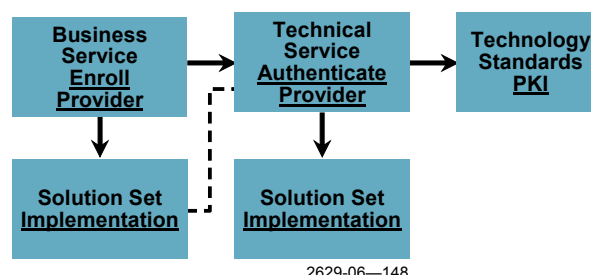
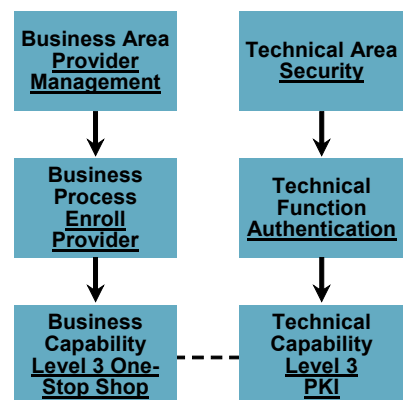
The Authentication Function has different Technical Capabilities corresponding to the Maturity Model 1 – 5 Levels.

Authenticate Provider at Level 2 uses an EDI message between the provider and the Medicaid agency; at Level 3 it uses a Personal Key Interface.

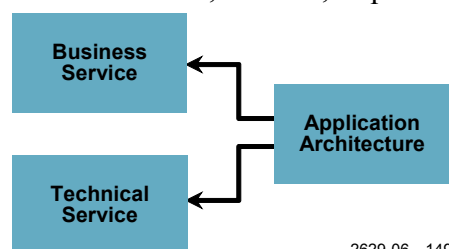
There is a loose link between the Business Capability and the Technical Capability at Level 3. Technical capabilities assigned to a maturity level are enablers of business processes at the corresponding level.

The parallel between Business Architecture and Technical Architecture continues. A business service is defined for each Business Capability at Level 3 and above. A technical service implements a specific Technical Capability at Level 3 and above.

Both business services and technical services use one or more solution sets containing instructions for the physical implementation of the service. Business services are associated with business processes (e.g., Provider Enrollment), and technical services are associated with technical functions (e.g., Authentication).



A business service solution set may require use of specific technical services. For example, Enroll Member, Level 3, requires encryption provided by a Technical Service at Level 3. A technical service defined for a Level 3 or above Business Capability uses technology standards associated with that level.



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The final component of the Technical Architecture is the Application Architecture, which defines the environment and orchestrates the business and technical services.

How Should Framework 2.0 Be Read?

The MITA Framework 2.0 is organized into three parts:

- Part I — Business Architecture
- Part II — Information Architecture
- Part III — Technical Architecture

Each part contains several chapters, and Part I includes four appendices. Because of the size and complexity of the document, the headings in the Table of Contents and the details in this Introduction to the MITA Framework are intended to serve as a roadmap for readers. All readers are encouraged to begin with the Overview of the MITA Initiative, the Introduction to the MITA Framework 2.0, and the Introductions to Parts I, II, and III.

Part I is the most complete section of the Framework document. Its components have benefited from reviews by States and the National Medicaid EDI HIPAA (NMEH) MITA workgroup. The four appendices contain additional background material on the COO and the MMM. Appendix C contains all business process descriptions completed to date. Appendix D contains the detailed BCM corresponding to the business processes. Member, provider, and operations management business capabilities are more developed than the other business areas.

The MITA initiative is a work in progress, and the Framework only captures the components as they exist at the time of publication. Through the collaboration of State Medicaid agencies, CMS, and the vendor community, as well as coordination with national and Federal initiatives, MITA seeks to continuously improve the products and tools contained in this Framework document. With this in mind, some components found in Parts I, II, and III are more developed than others. For instance, the Introduction to each Part and the Introduction section at the start of each chapter are very well developed and orient the reader to the scope, status, and objectives of the content presented in that text.

CMS does not intend to republish Framework 2.0. Rather, the MITA team welcomes all comments and questions from the readers, and CMS intends to incorporate responses to these communications into Release 3.0 of the Framework document.

Printers and computer screens differ in the reproduction of shades of colors and tones of black and white font, lines, and filler. This document contains many graphics. The MITA team has tried to use color schemes compatible with most color and black-and-white printers. If you are having difficulty viewing some pages, we suggest experimenting with a higher resolution printer.